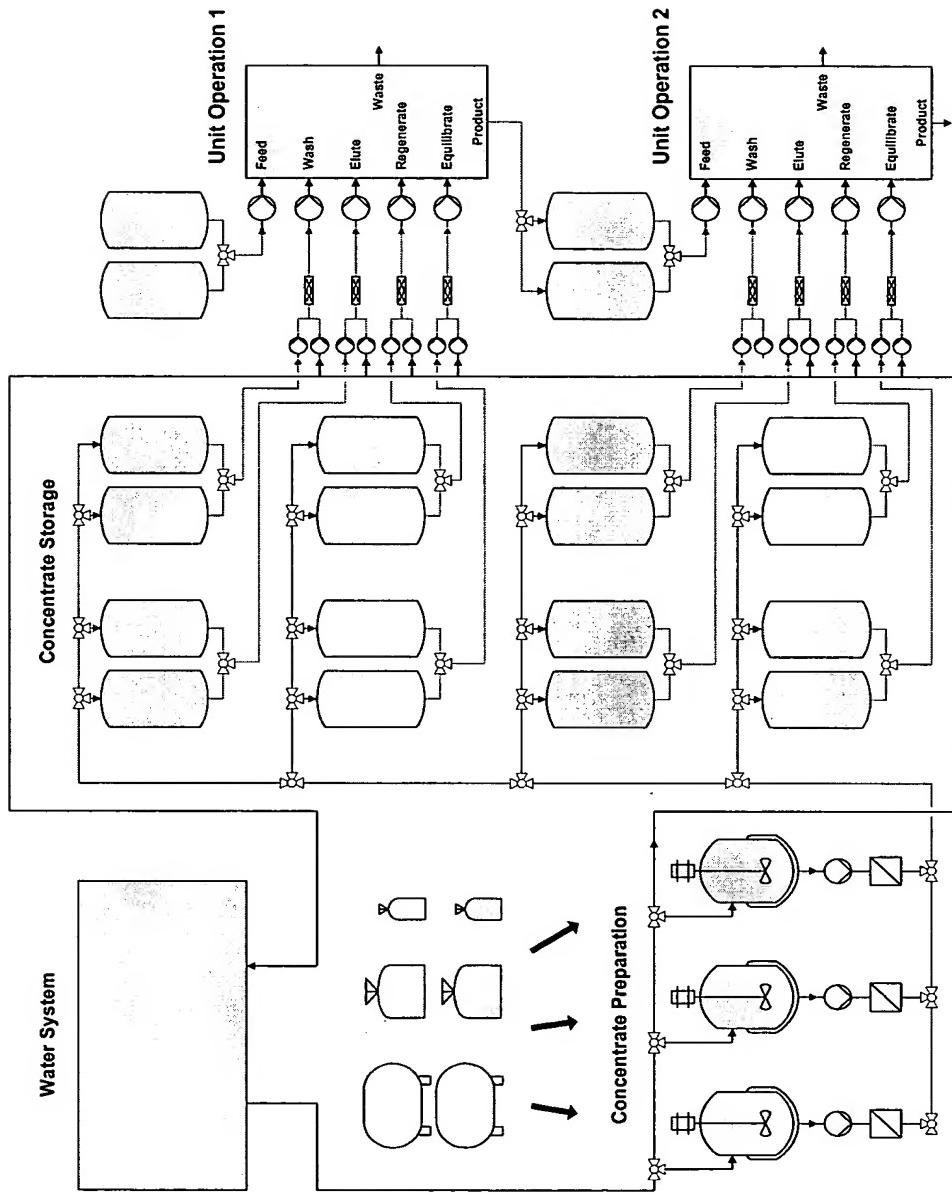


**Downstream processing with conventional batchwise  
solution blending of the prior art**



**FIG. 1**

## Downstream Plant with Continuous Solution Blending

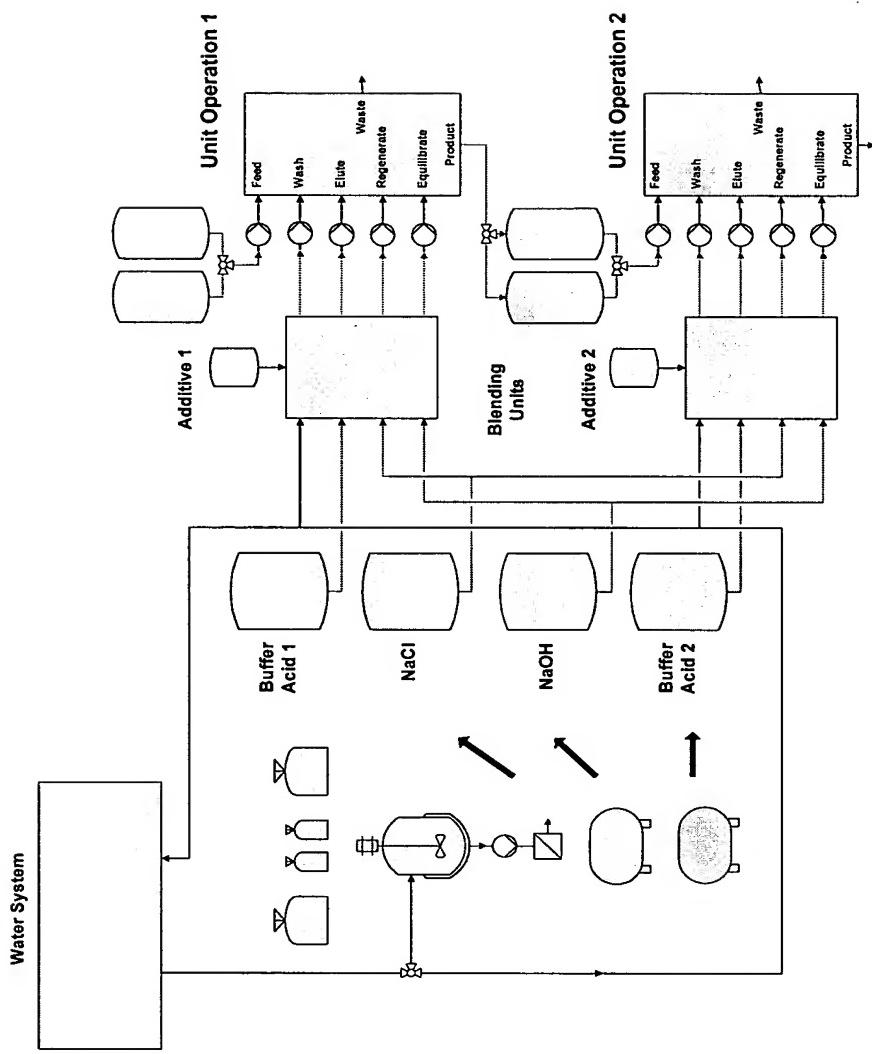


FIG. 2

## Typical buffer blending unit for direct online blending

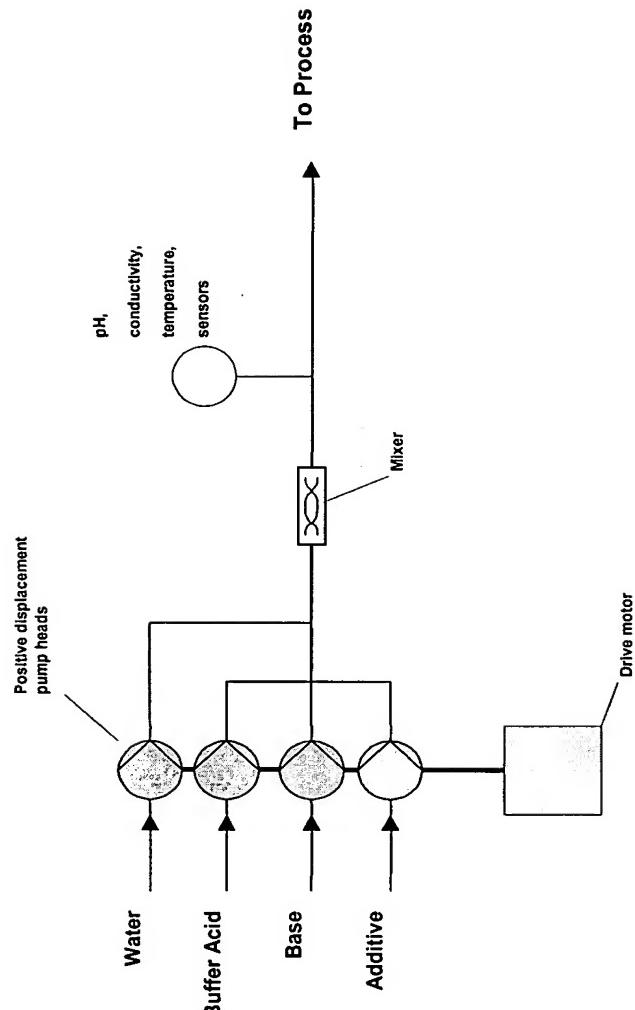


FIG. 3

## Typical buffer blending unit with inline mixing tank

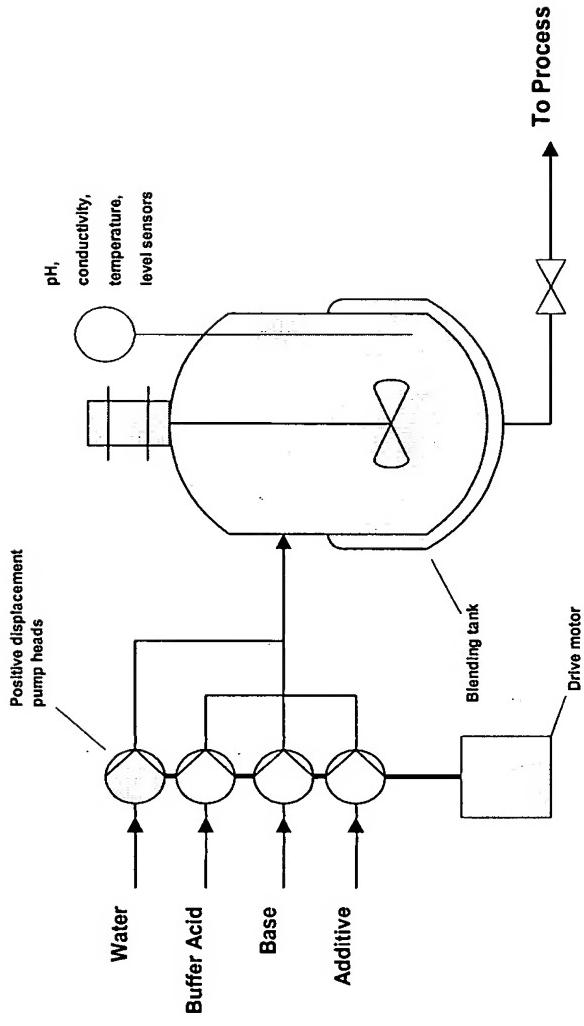


FIG. 4

## Facility Elements of a Typical Biopharmaceutical Production Plant

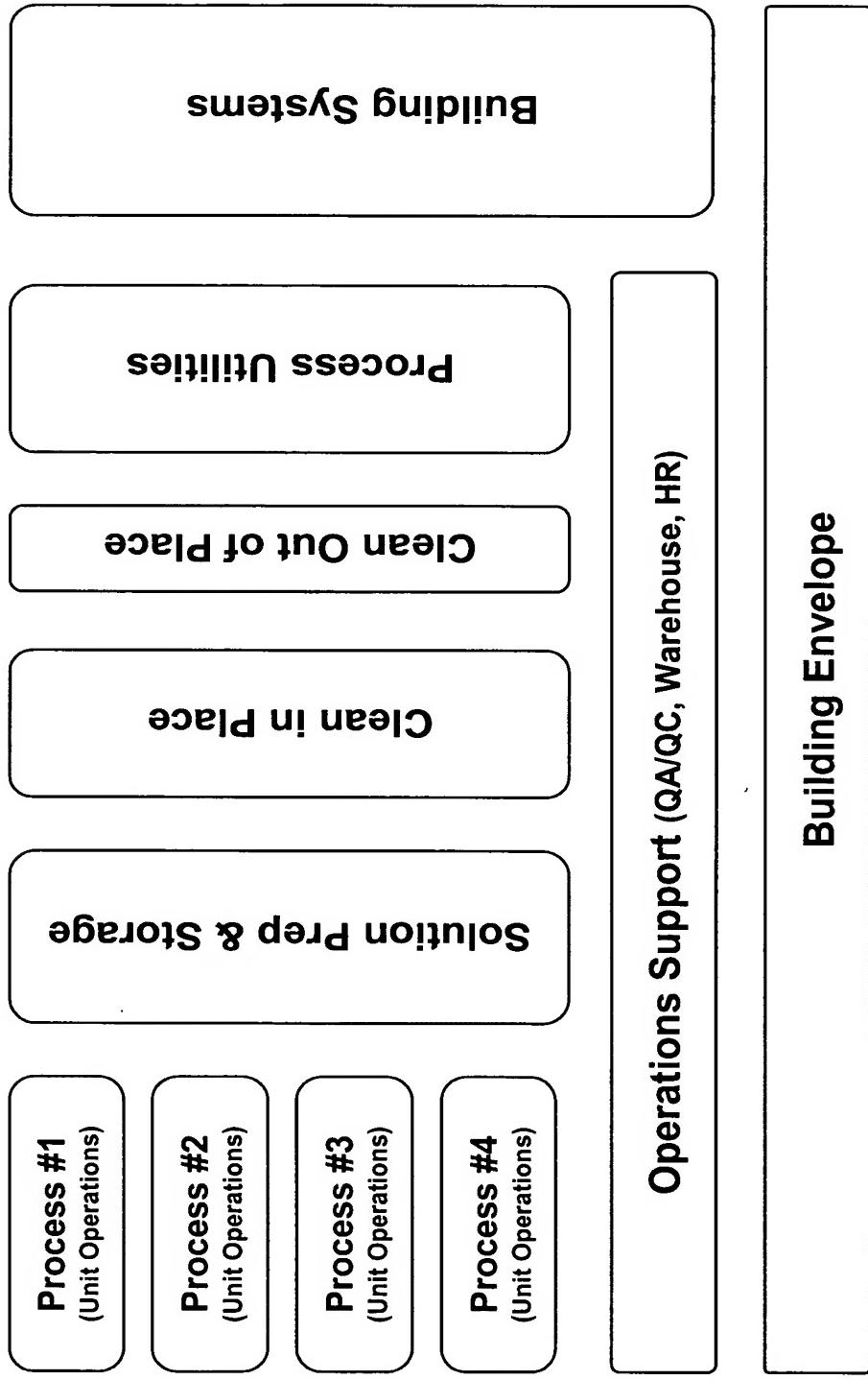


FIG. 5

## Transgenic human serum albumin processing scheme

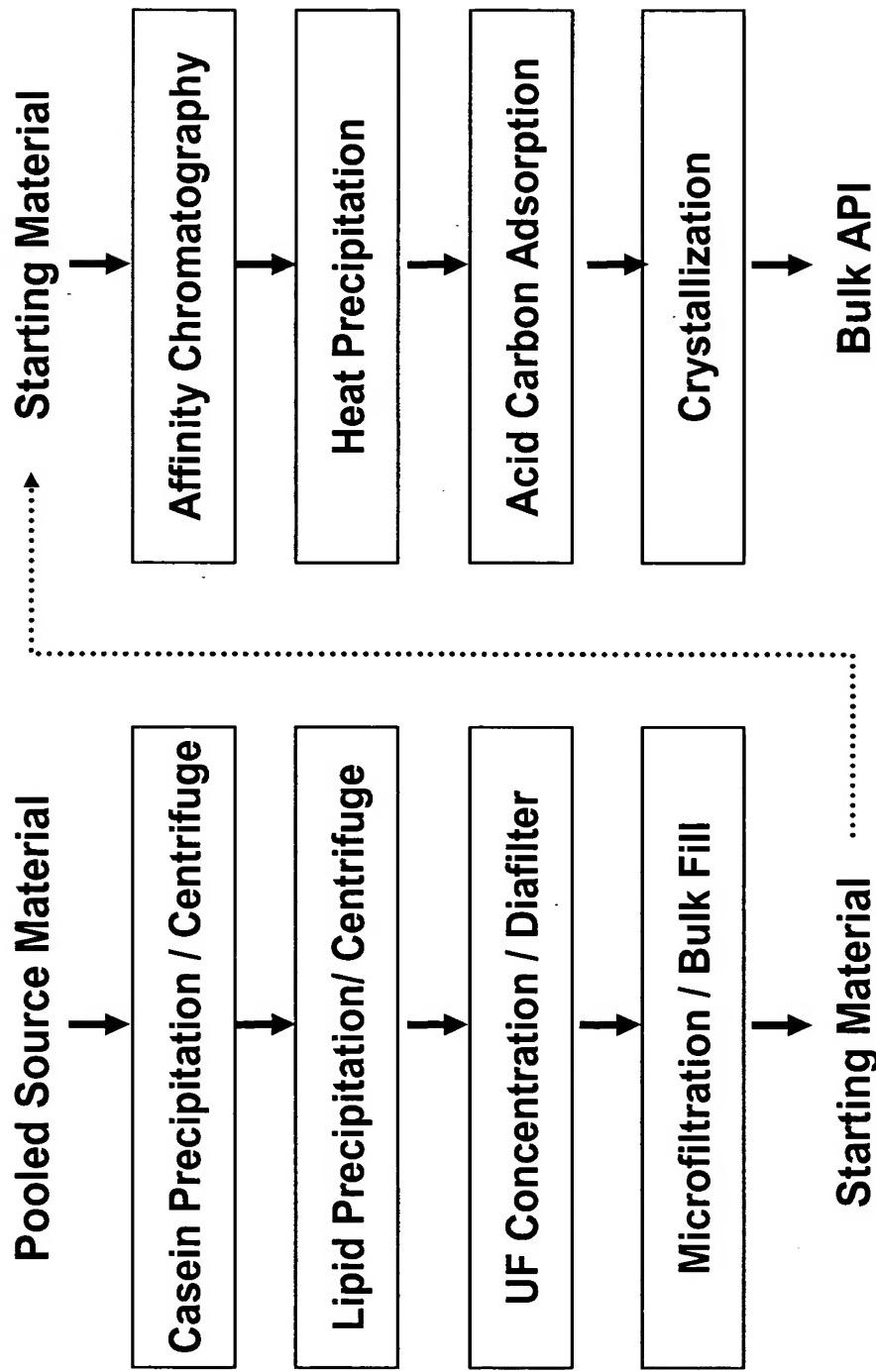


FIG. 6

## **Capital cost comparison between conventional batchwise and continuous blending processes**

	Conventional Design	Continuous Blending
Facility	\$10.0 MM	\$8.4 MM
Process equipment	\$12.9 MM	\$12.9 MM
Solution Prep & CIP	\$8.4 MM	\$4.1 MM
Water system	\$5.9 MM	\$5.7 MM
Total	\$37.4 MM	\$31.3 MM

**FIG. 7**

## hSA Process SMB Design

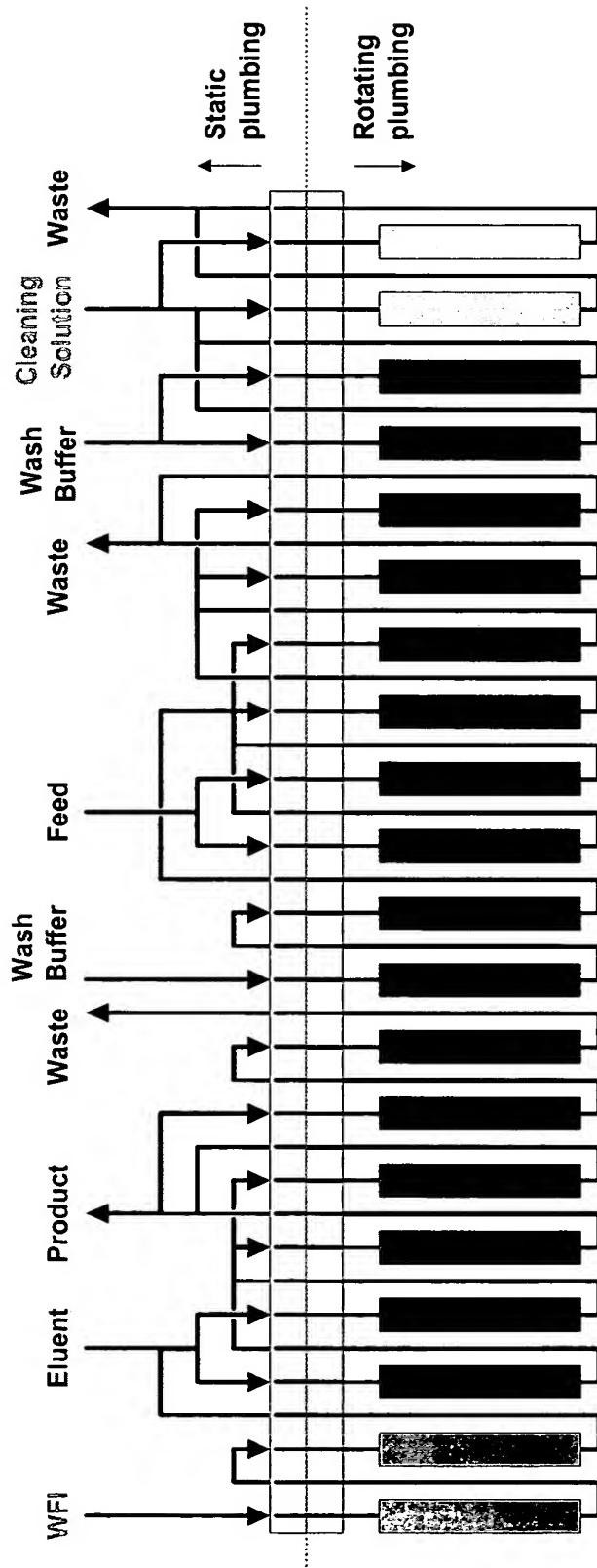


FIG. 8

## Transgenic hSA Purification Process

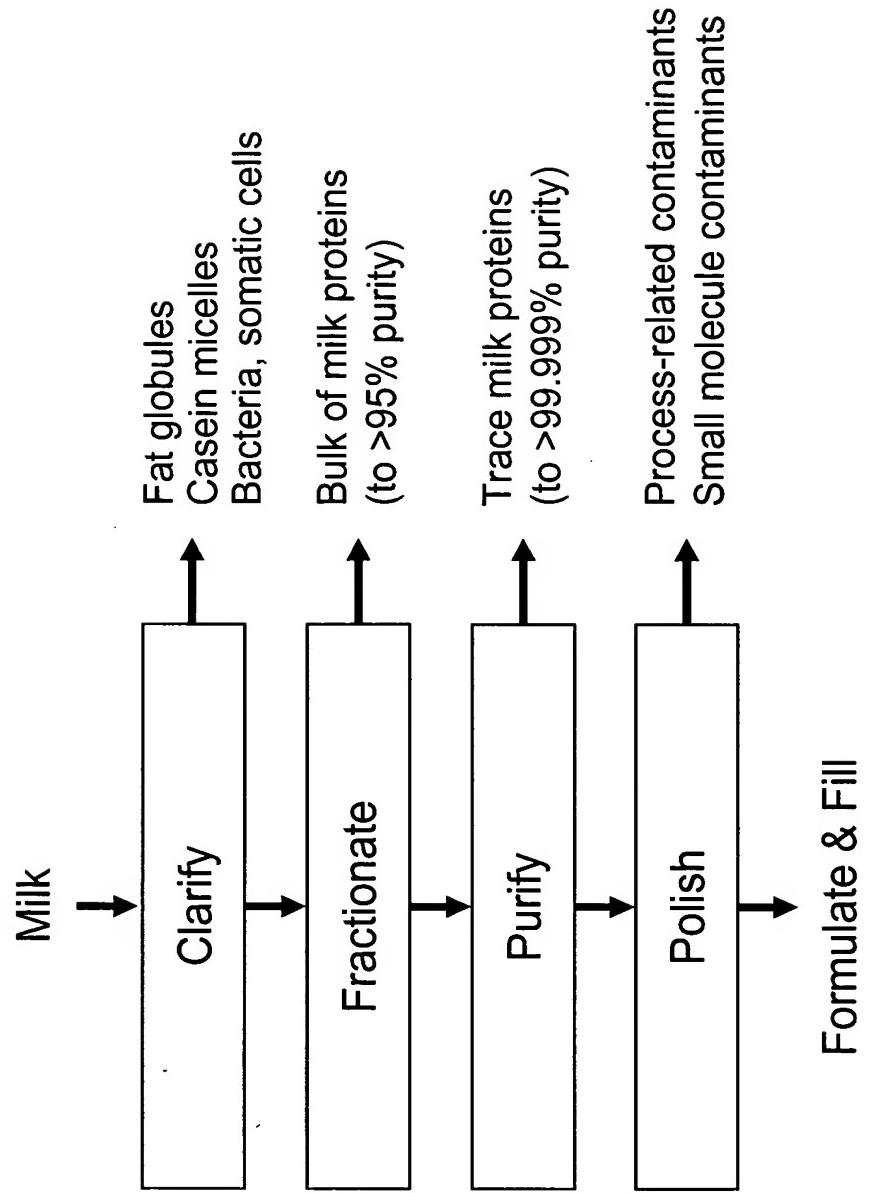


FIG. 9

## Downstream Plant with Continuous Solution Blending

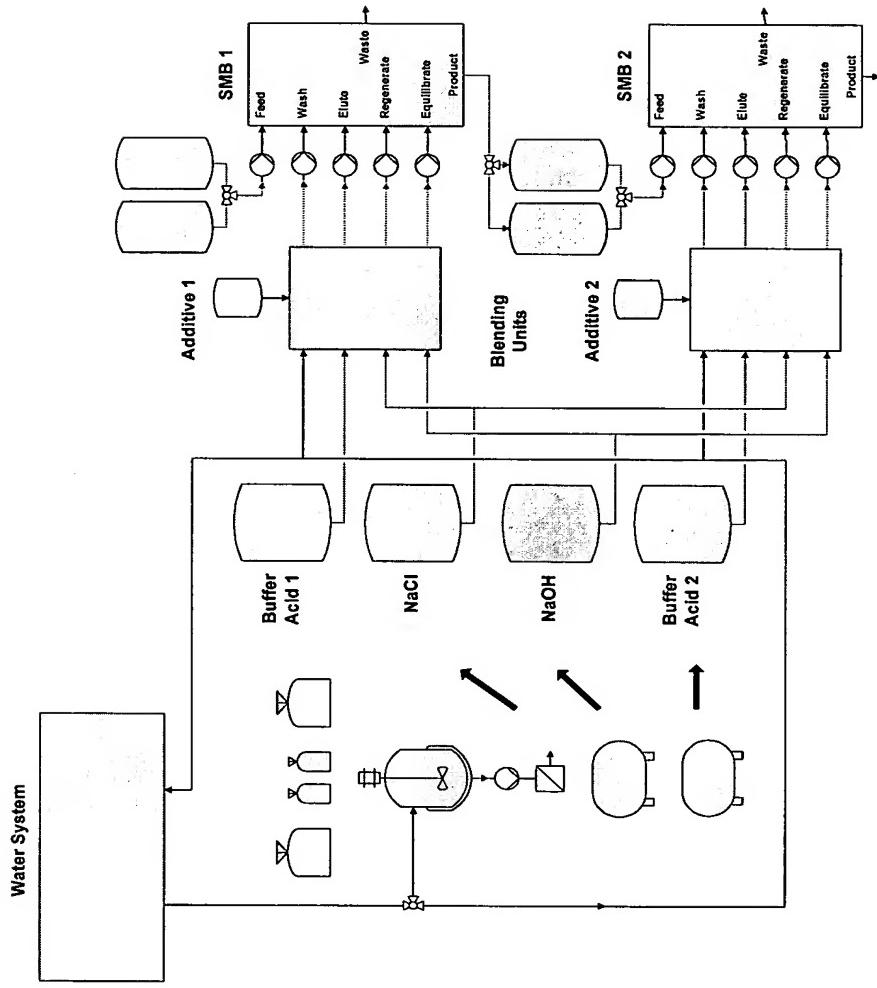


FIG. 10